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Bibliography on Atomic Line Shapes and Shifts (1889 through March 1972)

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Office of Standard Reference Data—Office of Technical Information and Publications—Library—Office of International Relations.

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Bibliography on Atomic Line Shapes and Shifts (1889 through March 1972)

J. R. Fuhr, W. L. Wiese, and L. J. Roszman

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BIBLIOGRAPHY ON ATOMIC LINE SHAPES AND SHIFTS (1889 Through March 1972)*

J. R. Fuhr, W. L. Wiese, and L. J. Roszman

This is the first general, annotated bibliography on atomic line shapes and shifts. It covers exhaustively the atomic spectral line broadening literature in about 1400 separate references extending from 1889 through March 1972. The bibliography contains four major parts: (1) All general interest papers are cataloged according to the broadening mechanisms (and, further, according to special topics under several of the mechanisms) and as to whether the work is a general theory, a general review, a table of profiles or parameters, a comment on existing work, a study of general experimental measurement techniques, or an experimental effort of general importance. Also included are selected papers on important applications of line broadening and on miscellaneous topics relating to atomic spectral line shapes and shifts. (2) In Part 2, all papers containing numerical data are ordered as to element, ionization stage, broadening mechanism (in the case of foreign gas broadening the perturbing species are listed), and it is indicated whether the data are experimentally or theoretically derived. (3) While in the two preceding parts of the bibliography the references are listed for brevity by identification numbers only, in Part 3 all references are listed completely by journal, authors, and title and are arranged chronologically and alphabetically within each year according to the principal author. (4) A final section contains a list of all authors and their papers.

Key words: Atomic; instrumental broadening; line shapes; line shifts; pressure broadening; resonance broadening; Stark broadening; Van der Waals broadening.

A. INTRODUCTION

1. OBJECTIVES AND BACKGROUND

A Data Center on Atomic Spectral Line Shapes and Shifts has been established recently in the Optical Physics Division of the National Bureau of Standards. The objectives of the Center are to collect and catalog the relevant literature and to prepare and publish bibliographies and critical reviews on various topics in atomic line broadening.

The collection of literature on line broadening was started some time ago parallel to a collection of the literature on atomic transition probabilities, which is an ongoing activity of this NBS group. Starting in 1970, all references in recent line broadening papers were scanned, and simultaneously, several title and abstracting journals were searched backward for several years. This latter search gradually overlapped

completely with the independently found references. Reprints or copies of all articles were collected, cataloged, and filed according to a classification scheme which will be given in detail below. The literature collection is completely up-to-date through March 1972, and the current literature is constantly being monitored through several title and abstracting journals. However, we have been unable to secure a few older theses and technical reports, and we have several as yet untranslated Russian papers which could be potentially valuable for this collection. These papers are presently not included, but will be added in future bibliographies after we are able to make a definite classification.

* Research supported in part by the Advanced Research Projects Agency of the Department of Defense under the Strategic Technology Office.

2. SCOPE OF THIS COLLECTION

A general bibliography on atomic line broadening seems to be long overdue, since the large number of articles we have collected indicates much continuing activity in this field. Nevertheless, no general annotated bibliography has been published.

In this first bibliography we have stressed the complete presentation of all relevant modern literature without regard to the quality of the paper. Therefore, all line broadening work back to the year 1930 and a number of important earlier papers have been included. In many instances the early work is superseded by more refined experimental or theoretical determinations, but there are still a number of cases where nothing but some older material is available. In such cases this older material should still be valuable for applications where a rough estimate will suffice.

In addition to the regular journal literature, we list books which are primarily devoted to the subject of line broadening or contain a special detailed chapter on line broadening. However, we do not list books which contain only a few pages of basic discussion on line broadening mechanisms.

Conference talks are quoted only if they are published in proceedings which can be generally obtained in libraries. However, if it appears that such a talk is superseded by a later paper of the same title in a journal, we quote only the more accessible journal publication. The above statement implies that we

do not quote conference talks which are only published in abstract form or which are distributed on some typewritten proceedings available essentially to conference participants only.

We also do not quote interim or final technical reports. Since many of these are written to fulfill either educational requirements at a university or serve to satisfy contract requirements, these reports are generally not available—except maybe for a short time—so that their listing in this bibliography does not represent any significant service to the scientific public. The large majority of these reports have become available later as publications in the open literature if they contained new and original results.

The situation on doctoral theses is quite similar, i.e., most theses are subsequently published in a shortened version which contains all the significant data. Again, we feel that we serve the scientific public most by listing only the journal publication which gives the shortened version of the thesis. If a full thesis is desired, the journal publication will usually list the author and his address.

While the bibliography is restricted to line shape and line shift data of atomic and ionic lines, we have included a representative cross section of recent papers on the broadening of molecular lines (Part 1.5.3). Also, we have included a cross section of representative recent papers on important applications of line broadening (Part 1.4)—usually about 20 to 25 papers for each major subject.

3. ARRANGEMENT OF THE BIBLIOGRAPHY

The bibliography is arranged in four main parts. In the first part we list all papers which are of general interest, i.e., papers which describe a general theory, give a general review of line broadening mechanisms or have comments on refinements of existing work, refer to general experimental measurement techniques, etc. Specifically, these articles are arranged under seven major headings. A detailed listing of these headings is given in the Contents under Part 1 "LITERATURE REFERENCES OF GENERAL INTEREST." Under each of the individual headings the papers are given by an identification number only in order to keep the size of this compilation compact. This identification number is fully referenced by author, journal, and title of the paper in Part 3.

In Part 2 of the bibliography we list all papers which contain numerical data, either theoretical or

experimental. The papers are now ordered to element and within the elements to the successive stages of ionization. The elements are listed in alphabetical order of their symbols. One paper (No. 651) contains data for the whole isoelectronic sequence of hydrogen and is listed after the papers on hydrogen.

For each spectrum we have grouped together all papers dealing with the same line broadening mechanism and have subdivided them further into experimental (E) and theoretical (T) papers and comments (C). The explanatory code words and letters are given in the column "Description." The papers for each group are listed in the column "Reference No." according to the identification numbers assigned in Part 3. Since these numbers, as we shall see in Part 3, are in chronological order, this means that the most modern papers are at the end of each list, and one should preferably, in looking up the litera-

ture, go from the high numbers back to the low ones.

For papers on Van der Waals broadening we also show the species which cause the broadening, if these are explicitly given by the authors. On natural line broadening we have presented only the directly determined numerical material. But since the natural line width or "damping constant" is given by the inverse sums of the lifetimes of upper and lower state of the line, one may use lifetime data for obtaining these widths. Available lifetime data are given in the recent NSRDS compilations on atomic transition probabilities [1, 2]¹ or may be obtained from the NBS bibliography on atomic transition probabilities. [3].

In Part 3 of the bibliography the complete body of references is presented in chronological order, and the listings include the full titles. Within each year the references are arranged alphabetically according to the names of the principal author. For the current year 1972 this arrangement is, of course, preliminary since new papers will be added. If a paper is written in a foreign language, the title is translated, and the language in which the paper is written is added to the reference in parenthesis. The table at the end of

this introduction contains a complete list of the applied abbreviations. Each reference in this part has been assigned a running number which serves as the identification number for the preceding parts of this bibliography.

The journal abbreviations were applied according to the "ACCESS" compilation of the American Chemical Society [4]. The authors' names were alphabetized according to the "Anglo-American Cataloging Rules" prepared by the American Library Association, The Library of Congress, The Library Association, and The Canadian Library Association [5].

Part 4 of the bibliography is an author list, where each reference is given by its identification number from Part 3.

To facilitate the sorting of the reference material according to each of the four parts of the bibliography, computer programs were developed and applied. Punched cards for each reference contain: the author(s) of paper, year of paper, language of paper, description (theoretical, experimental or comment), and the classification of paper.

4. FUTURE PLANS OF THE DATA CENTER ON ATOMIC LINE SHAPES AND SHIFTS, AND ACKNOWLEDGEMENTS

We intend to issue supplements to this bibliography from time to time depending on the volume of the new incoming literature. We also plan to undertake critical reviews on certain well-defined subjects of line broadening. A first review on the present status of our knowledge of hydrogen Stark broadening is in the planning stage.

We gratefully acknowledge the assistance of Mrs. Georgia Martin in developing a computer program which allowed the easy cataloging and sorting of all articles for the various parts of this bibliography and Dean Pershing for assisting in the initial literature search. We also would like to thank Mrs. Roberta Jones for her competent assistance in typing and organizing this bibliography.

References

- [1] Wiese, W. L. Smith, M. W., and Glennon, B. M., Atomic Transition Probabilities—Hydrogen through Neon (A Critical Data Compilation), Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.), 4, Vol. 1 (May 1966).
- [2] Wiese, W. L., Smith, M. W., and Miles, B. M., Atomic Transition Probabilities—Sodium through Calcium (A Critical Data Compilation), Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.), 22, Vol. 2 (Oct. 1969).
- [3] Miles, B. M. and Wiese, W. L., Bibliography on Atomic Transition Probabilities (January 1916 through June 1969), Nat. Bur. Stand. (U.S.), Spec. Publ. 320 (Feb. 1970), and Fuhr, J. R. and Wiese, W. L., Nat. Bur. Stand. (U.S.), Spec. Publ. 320, Suppl. 1 (Sept. 1971).
- [4] Access—Key to the Source Literature of the Chemical Sciences, (Chemical Abstracts Service, American Chemical Society, Columbus, Ohio, 1969).
- [5] Anglo-American Cataloging Rules, Ed. C. Sumner (Spalding, American Library Assoc., Chicago, 1967).

¹ Figures in brackets indicate the literature references on this page.

5. TABLE OF CODE LETTERS AND ABBREVIATIONS

A. Description

1. T—theoretical method
2. E—experimental method
3. C—comment

B. Language

1. Dut.—Dutch
2. Fr.—French
3. Ger.—German
4. Ital.—Italian
5. Russ.—Russian

B. BIBLIOGRAPHICAL MATERIAL

I. LITERATURE REFERENCES OF GENERAL INTEREST

1.0. GENERAL ARTICLES ON LINE SHAPES AND SHIFTS (GENERAL THEORIES AND COMMENTS, ETC.)

Theoretical papers: 443, 1559, 1641, 1820, 1821

1.1. PRESSURE BROADENING

Comments: 267, 342, 849, 1293

Experimental papers: 63, 64

Theoretical papers: 6, 11, 77, 113, 126, 137, 150, 153, 154, 165, 168, 188, 189, 193, 213, 219, 230, 246, 282, 283, 316, 318, 325, 343, 356, 368, 388, 402, 404, 423, 444, 454, 473, 520, 558, 559, 560, 676, 730, 793, 832, 842, 889, 896, 899, 904, 931, 966, 973, 976, 986, 1042, 1049, 1050, 1051, 1057, 1061, 1078, 1103, 1145, 1155, 1159, 1163, 1187, 1195, 1202, 1309, 1342, 1386, 1391, 1392, 1396, 1432, 1433, 1436, 1437, 1489, 1497, 1512, 1584, 1709, 1723, 1788, 1797, 1813, 1814, 1816, 1825, 1826, 1830, 1862

1.1.1. Stark broadening and shifts

Comments: 604, 657, 848, 1884

Theoretical papers: 47, 48, 69, 152, 370, 432, 480, 482, 498, 506, 532, 537, 544, 558, 570, 571, 572, 574, 620, 652, 662,

Theoretical papers: 667, 727, 736, 788, 850, 858,
(cont.) 860, 893, 894, 916, 917, 997,
1055, 1056, 1151, 1161, 1184,
1259, 1275, 1298, 1338, 1400,
1424, 1425, 1460, 1461, 1492,
1498, 1502, 1519, 1520, 1570,
1662, 1666, 1696, 1711, 1729,
1730, 1735, 1737, 1748, 1749,
1811, 1819, 1859, 1871, 1873,
1885

Combined theoretical-comments: 1782

1.1.1.1. Hydrogen and hydrogen-like (overlapping) lines

Theoretical papers: 411, 535, 596, 711, 927, 1184,
1218, 1345, 1377, 1508, 1513,
1594, 1753, 1874

1.1.1.2. Isolated lines of neutral spectra

Theoretical papers: 770, 772, 1356, 1408, 1421,
1501, 1569, 1611, 1728, 1755

1.1.1.3. Isolated lines of ionic spectra

Theoretical papers: 1069, 1213, 1214, 1265, 1283,
1385, 1444, 1501, 1576, 1610,
1694, 1754, 1771, 1772

1.1.1.4. Topics of particular interest

A. Line wings

Theoretical papers: 659, 768, 981, 1222

B. Effects of collective electric fields

Comments: 1720

Experimental papers: 965, 1043, 1276, 1301,
1382, 1592, 1599, 1625,
1651, 1671, 1751, 1836

Theoretical papers: 698, 934, 1070, 1304, 1457,
1574, 1577, 1597, 1661,
1705, 1718, 1818, 1869

Combined theoretical-experimental: 1467

C. Asymmetries of H-lines

Experimental papers: 1833

Theoretical papers: 851, 852, 858, 1509

Combined theoretical-experimental: 448

D. Microfield distributions

Comments: 521, 657, 774, 841, 1079, 1186

Theoretical papers: 46, 445, 471, 526, 564,
568, 593, 597, 598, 618,
658, 666, 668, 706, 719,
721, 732, 756, 783, 915,
984, 1015, 1077, 1289,
1290, 1291, 1334, 1352,
1413, 1414, 1418, 1426,
1427, 1438, 1462, 1578,
1579, 1711, 1732, 1740,
1811, 1876

E. Magnetic fields

Experimental papers: 1423

Theoretical papers: 1073, 1267, 1418, 1869

Combined theoretical-experimental: 1091, 1205,
1266

1.1.2. Broadening in foreign gases (Van der Waals broadening)

Comments: 319, 1556, 1761, 1812

Theoretical papers: 94, 108, 114, 167, 170, 171, 182,
204, 207, 214, 238, 250, 275, 290,

Theoretical papers: 327, 384, 385, 409, 455, 495, 671,
(cont.) 672, 794, 863, 1039, 1182, 1201,
1226, 1299, 1389, 1404, 1415,
1434, 1455, 1477, 1494, 1495,
1499, 1507, 1510, 1564, 1586,
1588, 1602, 1664, 1715, 1731,
1763, 1766, 1824, 1880

Combined experimental-comments: 1287

Combined theoretical-experimental: 1443, 1716

1.1.2.1. Satellite bands

Comments: 1875

Theoretical papers: 1274, 1449, 1459, 1500, 1566,
1567, 1872

Combined theoretical-experimental: 1443

1.1.3. Resonance broadening

Comments: 1092

Theoretical papers: 41, 124, 245, 264, 270, 664, 839,
961, 1003, 1011, 1144, 1221, 1308,
1355, 1389, 1395, 1410, 1548, 1565,
1626, 1704, 1710, 1744, 1747, 1793

Combined theoretical-experimental-comments: 1466

1.2. BASIC ARTICLES ON DOPPLER AND NATURAL LINE SHAPES

1.2.1. Doppler broadening

Theoretical papers: 1, 650, 731, 840, 1260, 1473,
1624, 1861

Combined experimental-comments: 1287

Combined theoretical-experimental: 1448

1.2.2. Natural line broadening

Theoretical papers: 127, 128, 161, 403, 421, 449,
594, 612, 926, 995, 996, 1470,
1698, 1779

1.2.3. Radiation induced broadening

Experimental papers: 1639

Theoretical papers: 446, 595, 790, 1071, 1692, 1738,
1739, 1770

1.3. BASIC PAPERS ON INSTRUMENTAL BROADENING, DECONVOLUTION,
SUPERPOSITION OF TWO OR MORE SIMULTANEOUSLY ACTING BROADENING
MECHANISMS

1.3.1. Determination of instrumental line profiles;
experimental techniques for determining line shapes

Experimental papers: 483, 722, 824, 900, 1048,
1216, 1278, 1585, 1794, 1810

Theoretical papers: 123, 576, 1074, 1337, 1801, 1803

Combined theoretical-experimental: 93, 825

1.3.2. Deconvolution

Theoretical papers: 134, 146, 160, 345, 371, 426,
470, 576, 648, 649, 762, 792,
885, 970, 1005, 1040, 1101,
1185, 1254, 1271, 1317, 1329,
1582, 1607, 1726, 1864

Combined theoretical-experimental: 937, 1475, 1476

1.3.3. Superposition of broadening mechanisms

Comments: 990, 1790

Theoretical papers: 31, 335, 425, 430, 707, 718, 823,
829, 903, 910, 933, 983, 1008,
1017, 1018, 1050, 1053, 1100,

Theoretical papers: 1138, 1203, 1210, 1211, 1269,
(cont.) 1277, 1323, 1351, 1723, 1780

1.4. IMPORTANT LINE BROADENING APPLICATIONS

1.4.1. Laser applications

Comments: 1148

Experimental papers: 1007, 1045, 1106, 1141, 1279,
1305, 1409, 1442, 1481, 1490,
1514, 1786, 1886

Theoretical papers: 699, 1100, 1210, 1286, 1299,
1463, 1562, 1598, 1609, 1652,
1656, 1707, 1735, 1770, 1861,
1868

Combined theoretical-experimental: 1046, 1108, 1448,
1887

1.4.2. Astrophysical applications

Comments: 1551, 1796

Experimental papers: 617, 1411, 1480, 1695, 1727,
1798, 1833

Theoretical papers: 891, 993, 1059, 1088, 1197,
1208, 1340, 1346, 1347, 1441,
1632, 1637, 1668, 1713, 1743,
1781, 1792, 1817, 1822

Combined theoretical-experimental: 1600

1.4.3. Plasma diagnostics

Experimental papers: 575, 795, 906, 923, 929, 965,
1113, 1524, 1528, 1549, 1625,
1671, 1834, 1836, 1837

Theoretical papers: 266, 366, 698, 835, 859, 1082,
1302, 1577, 1882.

Combined theoretical-experimental: 566, 1016

1.4.4. Other applications

Experimental papers: 969, 1076, 1194, 1757

Theoretical papers: 373, 1006, 1014, 1136

1.5. OTHER TOPICS INVOLVING LINE SHAPES AND SHIFTS

1.5.1. The line shape in the presence of self-absorption;
effects of radiative transfer

Comments: 517, 1172

Experimental papers: 107, 800, 801, 1714

Theoretical papers: 148, 334, 351, 352, 386, 422,
452, 613, 621, 759, 859, 911,
962, 998, 1001, 1209, 1260,
1693, 1713, 1744, 1745

Combined theoretical-experimental: 735

1.5.2. Broadening of scattered radiation

Experimental papers: 1722

Theoretical papers: 288, 421, 431, 1623, 1640, 1752

1.5.3. Some important papers on molecular line broadening

Experimental papers: 1268

Theoretical papers: 350, 474, 760, 765, 963, 1041,
1044, 1140, 1152, 1204, 1256,
1344, 1432, 1437, 1505, 1526,
1527, 1703, 1823, 1829, 1888

Combined theoretical-experimental: 1147

1.5.4. Miscellaneous topics

A. Broadening of x-ray lines

Theoretical papers: 192

B. Light shifts

Theoretical papers: 847, 1093, 1717, 1863

Combined theoretical-experimental: 1307

C. Zeeman broadening

Experimental papers: 890, 1216

D. Computer program calculation of line shapes,
assuming a Voigt profile

Theoretical papers: 1378

1.6. REVIEW ARTICLES

1.6.1. General line broadening reviews

101, 159, 175, 194, 254, 260, 484, 500, 701, 861,
895, 908, 1294, 1653

1.6.2. Reviews on pressure broadening

217, 303, 519, 545, 579, 645, 663, 729, 797, 1054,
1078, 1343, 1407

1.6.2.1. Reviews on Stark broadening

607, 757, 1004, 1016, 1504

1.6.2.2. Reviews on foreign gas broadening

505, 523

1.6.3. Reviews on Doppler and natural line broadening

1.6.3.1. Doppler broadening reviews

656, 977

1.6.3.2. Natural line broadening reviews

No papers in this category.

1.7. REFERENCES ON LINE BROADENING TABLES AND BIBLIOGRAPHIES

1.7.1. General line broadening tables

822, 1010, 1094

1.7.2. Pressure broadening tables

369, 903

1.7.2.1. Special Stark broadening tables

619, 843, 907, 908, 999, 1166, 1603, 1706,
1769

1.7.2.2. Special foreign gas broadening tables

No papers in this category.

1.7.2.3. Special resonance broadening tables

No papers in this category.

1.7.3. Doppler and natural line broadening tables

No papers in this category.

1.7.4. Tables of Voigt functions

983

1.7.5. Line broadening bibliographies

1257

2. LITERATURE REFERENCES CONTAINING NUMERICAL DATA

(References on individual elements and stages of ionization,
classified according to broadening mechanism)

<u>Description</u>	<u>Reference No.*</u>	<u>Description</u>	<u>Reference No.*</u>
Ag (Silver)			
	Ag I		Al III
Resonance, E	890	Stark, E	784, 921, 922
Stark, E	76	Stark, T	1733
Van der Waals, E	405 <u>by</u> <u>Ar</u>	Stark, T, E	857
	405 <u>by</u> <u>He</u>	Stark-Doppler, T	1733
	531 <u>by</u> <u>N₂</u>		
	Ag II	Ar (Argon)	
Stark, E	469		Ar I
Al (Aluminum)		Resonance, E	536, 600, 715, 930, 938, 1472
	Al I	Resonance, T	1196
Pressure, E	220	Stark, E	708, 764, 831, 985, 1000, 1080, 1090, 1157, 1167, 1183, 1248, 1292, 1310, 1333, 1394, 1397, 1491, 1629, 1633, 1635, 1644, 1806
Stark, E	1613	Stark, T	769, 1249, 1706, 1775
Stark, T	1706	Van der Waals, E	938, 1465 <u>by</u> <u>Ar</u>
Van der Waals, E	1451 <u>by</u> <u>Ar</u>	Van der Waals, T	1590, 1604, 1775 <u>by</u> <u>Ar</u>
Van der Waals, T	1750 <u>by</u> <u>Ar</u>		
	1750 <u>by</u> <u>H₂</u>		
	1750 <u>by</u> <u>He</u>		
	Al II		
Stark, E	784, 1310		

*The numbers refer to paper identification numbers of Part 3.

<u>Description</u>	<u>Reference No.*</u>
	Ar II
Natural, E	1886
Pressure, E	1774
Stark, E	139,580,603,605, 608,708,784,785, 965,1000,1081, 1090,1102,1157, 1183,1251,1261, 1292,1326,1327, 1405,1454,1464, 1491,1615,1629, 1806
Stark, T	1069,1150,1160, 1169,1213,1214, 1247,1264,1282, 1283,1324,1501, 1646
Stark, T,E	857,1212,1255

B (Boron)

	B I
Stark, T	1706

Ba (Barium)

	Ba I
Resonance, E	1487
Stark, E	557
Van der Waals, E	1488 <u>by</u> <u>Ar</u> 1488 <u>by</u> <u>He</u> 1488 <u>by</u> <u>Kr</u> 531,716,1605 <u>by</u> <u>N₂</u> 1488 <u>by</u> <u>Ne</u>

<u>Description</u>	<u>Reference No.*</u>
Van der Waals, T	1750 <u>by</u> <u>Ar</u> 1750 <u>by</u> <u>H₂</u> 1750 <u>by</u> <u>He</u>
	Ba II
Stark, E	543,557,614,1456, 1802,1879
Stark, T	1160
Van der Waals, E	773 <u>by</u> <u>Ar</u> 773 <u>by</u> <u>He</u>
Van der Waals, T	1750 <u>by</u> <u>Ar</u> 1750 <u>by</u> <u>H₂</u> 1750 <u>by</u> <u>He</u>

Be (Beryllium)

	Be I
Stark, T	1706
	Be II
Stark, E	1802,1879
	Be III
Stark, E	1276
	Be IV
Stark, C	1670
Stark, E	1276

Bi (Bismuth)

	Bi I
Stark, E	1613

*The numbers refer to paper identification numbers of Part 3.

Br (Bromine)

Br I

Pressure, E	92
Stark, E	1253

C (Carbon)

C I

Stark, E	1190, 1253, 1310, 1484, 1633
Stark, T	1225, 1706

C II

Stark, E	1190, 1215, 1341, 1589
Stark, T	1069, 1150, 1160, 1330, 1435, 1501, 1771, 1815
Stark-Natural, T	1878

C III

Stark, E	1341, 1860
Stark, T	1815

C IV

Stark, E	1860
Stark, T	1815
Stark-Natural, T	1878

Ca (Calcium)

Ca I

Doppler, E	546
Line, E	1714

Pressure, E	49, 546
Resonance, E	1487
Stark, E	289, 538, 785, 1621
Stark, T	432, 1706
Van der Waals, E	392
Van der Waals, E	1219, 1451, 1488, 1725 <u>by Ar</u> 573 <u>by H₂</u> 567, 599, 654, 1219, 1488, 1725 <u>by He</u> 1219, 1488 <u>by Kr</u> 531, 716, 785, 1605 <u>by N₂</u> 1219, 1488 <u>by Ne</u>
Van der Waals, T	1496, 1590, 1604, 1750 <u>by Ar</u> 1750 <u>by H₂</u> 1496, 1590, 1604, 1750 <u>by He</u> 1496, 1590, 1604 <u>by Kr</u> 1496, 1590, 1604 <u>by Ne</u> 1496 <u>by Xe</u>
Doppler-Pressure, T, E	1116
	Ca II
Stark, E	1115, 1215, 1573, 1621, 1758, 1805, 1879
Stark, T	432, 828, 893, 894, 1058, 1069, 1149, 1150, 1160, 1169, 1283, 1501, 1554, 1699, 1771, 1889

*The numbers refer to paper identification numbers of Part 3.

<u>Description</u>	<u>Reference No.*</u>
Stark, T,E	1871
Van der Waals, E	1451 <u>by</u> <u>Ar</u>
Van der Waals, T	1750 <u>by</u> <u>Ar</u>
	1750 <u>by</u> <u>H₂</u>
	1750 <u>by</u> <u>He</u>

Cd (Cadmium)

	Cd I
Resonance, E	21, 136, 665, 890, 897, 994, 1200, 1315
Resonance, T	896
Stark, E	709, 758, 1192
Van der Waals, E	237, 496, 901, 1139, 1198, 1273, 1314, 1430 <u>by</u> <u>Ar</u> 136, 787 <u>by</u> <u>Cd</u> 237, 1139, 1273, 1430 <u>by</u> <u>He</u> 21 <u>by</u> <u>Hg</u> 1139 <u>by</u> <u>Kr</u> 1555 <u>by</u> <u>N₂</u> 1139, 1314, 1316 <u>by</u> <u>Ne</u> 1555 <u>by</u> <u>O₂</u> 1273, 1314, 1315, 1316, 1430, 1634 <u>by</u> <u>Xe</u>
Van der Waals, T	1496 <u>by</u> <u>Ar</u> 1496 <u>by</u> <u>He</u> 1496 <u>by</u> <u>Kr</u> 1496 <u>by</u> <u>Ne</u> 1496 <u>by</u> <u>Xe</u>
	Cd II
Stark, E	709, 1192

<u>Description</u>	<u>Reference No.*</u>
Cl (Chlorine)	
	Cl I

Stark, E	1253, 1310, 1617, 1633, 1804
Stark, T	1325, 1706
Van der Waals, E	1521 <u>by</u> <u>Ar</u>

	Cl II
Stark, E	1253, 1619, 1773, 1804

Co (Cobalt)

	Co I
Van der Waals, E	531 <u>by</u> <u>N₂</u>

Cr (Chromium)

	Cr I
Line, T	1743
Van der Waals, E	781, 1452 <u>by</u> <u>Ar</u> 1452 <u>by</u> <u>He</u> 531 <u>by</u> <u>N₂</u>
Van der Waals, T	1750 <u>by</u> <u>Ar</u> 1750 <u>by</u> <u>H₂</u> 1750 <u>by</u> <u>He</u>

Cs (Cesium)

	Cs I
Resonance, E	297, 611, 1086, 1262, 1741, 1785
Resonance, T	324, 1003, 1515, 1642, 1663

*The numbers refer to paper identification numbers of Part 3.

<u>Description</u>	<u>Reference No.*</u>	<u>Description</u>	<u>Reference No.*</u>
Stark, E	821,905,1068, 1306,1613,1627, 1867	Van der Waals, E (cont.)	201,533,697,704, 1158,1285,1440, 1659,1827 <u>by Kr</u> 36,162,163,185, 187,247,248,533, 616,697,716 <u>by</u> <u>N₂</u> 162,163,184,185, 187,248,533,561, 704,1173,1431, 1440,1659,1866, <u>by Ne</u> 200,533,697,704, 1272,1285,1402, 1431,1440,1659, 1827 <u>by Xe</u>
Stark, T	769,1282,1501, 1706,1882,1883		
Stark, T,E	796,1650		
Van der Waals, C	1870 <u>by Ar</u> 1870 <u>by He</u>		
Van der Waals, E	162,184,185,187, 248,472,533,540, 561,616,697,704, 1086,1272,1401, 1403,1431,1440, 1575,1659,1724, 1809,1827,1866 <u>by Ar</u> 1724,1827 <u>by Ar-He</u> 206,1741,1875 <u>by Cs</u> 1402,1440 <u>by CF₄</u> 1431 <u>by C₅H₁₂</u> 533 <u>by D₂</u> 247,248,533,791 <u>by H₂</u> 162,184,185,187, 248,472,533,561, 697,704,1062,1272, 1431,1440,1659, 1724,1809,1827, <u>by He</u> 1827 <u>by He-Kr</u> 1827 <u>by He-Xe</u> 183,200 <u>by Hg</u> 533,845 <u>by</u> <u>Hydrocarbons</u>	Van der Waals, T	166,556,602,606, 670,713,844,1252, 1412,1765,1766, 1858 <u>by Ar</u> 1881 <u>by H</u> 556 <u>by H₂</u> 166,556,602,606, 670,713,1647, 1765,1766 <u>by He</u> 556,606,670,713, 844,1297,1412, 1872 <u>by Kr</u> 166,556,606,670, 713 <u>by N₂</u> 166,556,606,670, 713,1252 <u>by Ne</u> 556,602,606,713, 844,1297,1658, 1765,1766,1872 <u>by Xe</u> 914 <u>by C₅H₁₂</u>

*The numbers refer to paper identification numbers of Part 3.

<u>Description</u>	<u>Reference No.*</u>
Van der Waals, E,C (cont.)	914 <u>by</u> <u>N₂</u>
Van der Waals, T,E	1443 <u>by</u> <u>Kr</u>
	1443 <u>by</u> <u>Ne</u>
	1443,1608 <u>by</u> <u>Xe</u>
Stark-Zeeman, E	1649
Stark-Zeeman, T	1882
Cs II	
Van der Waals, T,E	1443 <u>by</u> <u>Kr</u>

Cu (Copper)

Cu I	
Pressure, E	145
Stark, E	76,135
Stark, T	1764
Van der Waals, E	781,1451 <u>by</u> <u>Ar</u>
	531 <u>by</u> <u>N₂</u>
Van der Waals, T	1764 <u>by</u> <u>Ar</u>

D (Deuterium)

D I	
Van der Waals, E	643,696,1742 <u>by</u> <u>Ar</u>
	1669 <u>by</u> <u>He</u>
	643,696 <u>by</u> <u>Ne</u>

Eu (Europium)

Eu II	
Van der Waals, T	1750 <u>by</u> <u>Ar</u>
	1750 <u>by</u> <u>H₂</u>
	1750 <u>by</u> <u>He</u>

<u>Description</u>	<u>Reference No.*</u>
F (Fluorine)	
F I	
Stark, T	1706
Van der Waals, E	1831 <u>by</u> <u>Ar</u>
	1831 <u>by</u> <u>F₂</u>
	1831 <u>by</u> <u>He</u>

F II	
Stark, E	734

F III	
Stark, E	734

Fe (Iron)

Fe I	
Line, T	1743
Pressure, C	281
Pressure, E	106
Van der Waals, E	714,781,1450
	<u>by</u> <u>Ar</u>
	573,1411 <u>by</u> <u>H</u>
	573 <u>by</u> <u>H₂</u>
	703,1450 <u>by</u> <u>He</u>
	531 <u>by</u> <u>N₂</u>
Van der Waals, T	1750 <u>by</u> <u>Ar</u>
	1590,1715 <u>by</u> <u>H</u>
	1750 <u>by</u> <u>H₂</u>
	1750 <u>by</u> <u>He</u>
Zeeman, T	1743

*The numbers refer to paper identification numbers of Part 3.

Ga (Gallium)

Ga I

Resonance, E	1207
Stark, E	1613
Van der Waals, E	1207 <u>by</u> <u>Ar</u>
	1207 <u>by</u> <u>He</u>
	1207 <u>by</u> <u>Ne</u>

Ge (Germanium)

Ge I

Stark, C	925
Stark, E	1612

H (Hydrogen)

H I

Doppler, T,E	989
Pressure, E	26,55
Resonance, E	1655
Resonance, T	699, 1474, 1503
Stark, C	886, 1099, 1552, 1595, 1596, 1712
Stark, E	62, 97, 135, 261, 332, 383, 407, 450, 475, 476, 479, 481, 499, 507, 518, 529, 575, 591, 642, 675, 700, 705, 720, 761, 776, 777, 778, 798, 799, 830, 833, 865, 892, 902, 913, 920, 940, 964, 992, 1013, 1047, 1063, 1075,

Stark, E (cont.)	1104, 1105, 1146, 1181, 1223, 1310, 1318, 1319, 1322, 1331, 1336, 1388, 1393, 1446, 1528, 1560, 1614, 1660, 1700, 1798, 1833, 1835
Stark, T	47, 48, 69, 249, 268 269, 283, 309, 406, 478, 524, 525, 526, 568, 577, 596, 615, 619, 651, 653, 655, 659, 660, 661, 667, 726, 736, 768, 771, 843, 852, 912, 928, 932, 981, 1060, 1082, 1087, 1096, 1166, 1170, 1176, 1177, 1180, 1189, 1217, 1218, 1250, 1282, 1295, 1296, 1311, 1312, 1313, 1338, 1339, 1377, 1379, 1380, 1381, 1509, 1511, 1518, 1519, 1557, 1561, 1603, 1636, 1665, 1697, 1711, 1721, 1748, 1753, 1799, 1800, 1819, 1832, 1877
Stark, T,C	1759
Stark, T,E	429, 448, 566, 712, 1095, 1205, 1600
Van der Waals, E	643, 696, 789, 1258, 1742 <u>by</u> <u>Ar</u>

*The numbers refer to paper identification numbers of Part 3.

<u>Description</u>	<u>Reference No.*</u>
Van der Waals, E (cont.)	1521 <u>by</u> <u>Ar-H₂</u> 643,696,789,1521 <u>by</u> <u>H₂</u> 643,696,789 <u>by</u> <u>He</u> 1270 <u>by</u> <u>Kr</u> 643,696,789 <u>by</u> <u>Ne</u> 1270 <u>by</u> <u>Xe</u>
Van der Waals, T	1415 <u>by</u> <u>Ar</u> 1474 <u>by</u> <u>H</u> 763,1415,1493, 1495,1510,1580, 1586,1776 <u>by</u> <u>He</u> 1415 <u>by</u> <u>Kr</u> 1415,1586 <u>by</u> <u>Ne</u> 1415 <u>by</u> <u>Xe</u>
Stark-Doppler, T	717,1468
Stark-Zeeman, E	1165,1423
Stark-Zeeman, T	1073,1085
Stark-Zeeman, T,E	1091
Stark-Zeeman-Doppler, T	1591
Stark-Doppler-Natural- Van der Waals, T	1303

H (Hydrogen) Sequence

Stark, T 651

He (Helium)

	He I
Doppler, T,E	989
Resonance, E	140,918,930,1111, 1112,1162
Resonance, T	1196,1628
Resonance, T,E,C	1466

<u>Description</u>	<u>Reference No.*</u>
Stark, C	1795
Stark, E	86,96,261,479, 581,608,733,761, 785,827,855,856, 920,935,940,1280, 1301,1382,1571, 1593,1599,1643, 1651,1672,1702, 1708,1719,1767, 1777,1791
Stark, T	47,95,310,317, 336,477,652,770, 893,999,1097, 1098,1175,1197, 1206,1281,1282, 1383,1384,1408, 1420,1439,1501, 1553,1569,1654, 1706,1711
Stark, T,C	1873
Stark, T,E	601,857,1095, 1600,1701
Stark-Resonance, E	856
Stark-Zeeman, E	1651
Stark-Zeeman, T	1267,1417,1419, 1583,1736
Stark-Zeeman, T,E	1266,1869

He II

Natural, E	1807
Stark, C	1595,1756
Stark, E	581,700,761,1043, 1137,1179,1445, 1563,1587,1592, 1767,1768

*The numbers refer to paper identification numbers of Part 3.

<u>Description</u>	<u>Reference No.*</u>
Stark, T	711, 768, 853, 1620, 1661, 1769
Stark, T, E	601, 1600
Hg (Mercury)	
Hg I	
Pressure, E	49, 78, 87, 253, 255, 302, 367
Resonance, C	779
Resonance, E	61, 98, 136, 203, 225, 226, 227, 232, 251, 252, 291, 355, 447, 527, 578, 723, 991, 1200, 1422
Resonance, T	270, 896, 1321, 1865
Stark, E	758
Van der Waals, C	919 <u>by Ar</u>
Van der Waals, E	16 <u>by Air</u> 61, 125, 129, 138, 231, 237, 252, 389, 410, 504, 528, 539, 541, 542, 578, 616, 673, 909, 1009, 1012, <u>by Ar</u> 129 <u>by CH₄</u> 129 <u>by C₃H₈</u> 1227 <u>by C₆H₁₄</u> 129 <u>by CO</u> 54, 61, 252 <u>by CO₂</u> 1357 <u>by Cd</u> 710, 838, 1067, 1156 <u>by D₂</u> 941, 1838 <u>by</u> <u>Hydrocarbons</u>

<u>Description</u>	<u>Reference No.*</u>
Van der Waals, E (cont.)	16, 54, 61, 125, 129 389, 410, 453, 528, 541, 578, 616, 710, 728, 838, 967, 1067 1156 <u>by H₂</u> 61, 344 <u>by H₂O</u> 125, 129, 138, 237, 244, 265, 453, 502, 528, 542, 578, 616, 967, 968, 978, 979, 1009, 1067, 1168 <u>by He</u> 99 <u>by He-Ne</u> 136, 344, 800, 801 <u>by Hg</u> 542, 609, 909, 1009, 1447 <u>by Kr</u> 1357 <u>by Mg</u> 54, 61, 125, 129, 252, 315, 344, 389, 410, 504, 528, 541, 578, 616 <u>by N₂</u> 129, 941 <u>by NH₃</u> 138, 539, 542, 967, 1009, 1168 <u>by Ne</u> 61, 252, 315 <u>by O₂</u> 541, 542, 578, 674, 909, 1009 <u>by Xe</u> 1357 <u>by Zn</u>
Van der Waals, T	94, 114, 151, 725, 794, 896, 1109, 1516, 1808 <u>by Ar</u> 114 <u>by CO</u> 151 <u>by CO₂</u> 114, 151 <u>by H₂</u> 114 <u>by H₂O</u>

*The numbers refer to paper identification numbers of Part 3.

<u>Description</u>	<u>Reference No.*</u>
Van der Waals, T (cont.)	94,114,794,896, 1220,1516,1517, 1657 <u>by</u> <u>He</u> 896,1808 <u>by</u> <u>Kr</u> 94,114,151,794 <u>by</u> <u>N₂</u> 896,1808 <u>by</u> <u>Ne</u> 151,794 <u>by</u> <u>O₂</u> 896,1808 <u>by</u> <u>Xe</u>

Van der Waals, T,E	503,610 <u>by</u> <u>Ar</u> 1443 <u>by</u> <u>D₂</u> 1443 <u>by</u> <u>H₂</u> 503,1443 <u>by</u> <u>He</u> 610 <u>by</u> <u>Kr</u> 503 <u>by</u> <u>N₂</u>
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Hg II

Pressure, E	147
Stark, E	1089

I (Iodine)

I I

Pressure, E	92
Van der Waals, E	1831 <u>by</u> <u>Ar</u> 1831 <u>by</u> <u>He</u> 1831 <u>by</u> <u>I₂</u>

In (Indium)

In I

Resonance, E	1207
Stark, E	1613
Van der Waals, E	647,702,1207 <u>by</u> <u>Ar</u>

<u>Description</u>	<u>Reference No.*</u>
Van der Waals, E (cont.)	647,1207 <u>by</u> <u>He</u> 1207 <u>by</u> <u>Ne</u> 702 <u>by</u> <u>Xe</u>

K (Potassium)

K I

Resonance, E	228,458,1471, 1784,1785
Resonance, T	324,1003,1515, 1642,1663
Resonance, T,E,C	1466
Stark, E	1613
Stark, T	1706
Van der Waals, E	180,183,184,186, 200,215,390,410, 504,540,616,644, 704,781,988,1083, 1084 <u>by</u> <u>Ar</u> 180,308,410,644, 791 <u>by</u> <u>H₂</u> 180,183,184,186, 263,644,704,988 <u>by</u> <u>He</u> 191 <u>by</u> <u>Hg</u> 988 <u>by</u> <u>Hydro-</u> <u>carbons</u> 644,704,988, 1479 <u>by</u> <u>Kr</u> 174,215,229,308, 410,531,716,988 <u>by</u> <u>N₂</u> 180,183,184,186, 644,704,988 <u>by</u> <u>Ne</u> 341 <u>by</u> <u>Rb</u>

*The numbers refer to paper identification numbers of Part 3.

<u>Description</u>	<u>Reference No.*</u>
Van der Waals, E (cont.)	704,988 <u>by</u> <u>Xe</u>
Van der Waals, T	602,794 <u>by</u> <u>Ar</u> 1881 <u>by</u> <u>H</u> 602 <u>by</u> <u>He</u> 1297,1872 <u>by</u> <u>Kr</u> 794 <u>by</u> <u>N₂</u> 602,1297,1872 <u>by</u> <u>Xe</u>

K IX

Stark, E	1154
Stark, T	1265

Kr (Krypton)

Kr I

Pressure, C	234
Resonance, E	1348,1349
Resonance, T	1196,1628
Resonance, T,E,C	1466
Van der Waals, C	233 <u>by</u> <u>Kr</u>
Van der Waals, E	1349,1399 <u>by</u> <u>Ar</u> 1399 <u>by</u> <u>H₂</u> 1349,1399 <u>by</u> <u>He</u> 216,826,1349 <u>by</u> <u>Kr</u> 1349,1399 <u>by</u> <u>Ne</u> 1399 <u>by</u> <u>Xe</u>
Van der Waals, T	1808 <u>by</u> <u>Ar</u> 1880 <u>by</u> <u>He</u> 1604 <u>by</u> <u>Kr</u> 1808 <u>by</u> <u>Ne</u>
Van der Waals, T,E,C	1466 <u>by</u> <u>Ar</u> 1466 <u>by</u> <u>Kr</u>

<u>Description</u>	<u>Reference No.*</u>
	Kr II
Stark, E	784,786
Stark, T,E	857

Li (Lithium)

Li I

Doppler, E	546
Pressure, E	49,546
Resonance, E	1114,1523
Resonance, T	1515
Stark, E	76,333,724,1288, 1353,1354,1523, 1524,1525,1613
Stark, T	767,980,1648, 1706,1882
Van der Waals, E	392
Van der Waals, E	704,780,781,1522 <u>by</u> <u>Ar</u> 704,780,781,1522 <u>by</u> <u>He</u> 704 <u>by</u> <u>Kr</u> 353 <u>by</u> <u>Li</u> 531,716 <u>by</u> <u>N₂</u> 1522 <u>by</u> <u>Ne</u> 704 <u>by</u> <u>Xe</u>
Van der Waals, T	602,1506 <u>by</u> <u>Ar</u> 1881 <u>by</u> <u>H</u> 602,1645 <u>by</u> <u>He</u> 1297,1872 <u>by</u> <u>Kr</u> 602,1297,1872 <u>by</u> <u>Xe</u>
Stark-Zeeman, T	1882

*The numbers refer to paper identification numbers of Part 3.

Mg (Magnesium)

Mg I

Resonance, E	136
Stark, E	557, 758
Stark, T	218, 1350, 1706
Van der Waals, E	136 <u>by</u> <u>Mg</u>
Van der Waals, T	1750 <u>by</u> <u>Ar</u>
	1750 <u>by</u> <u>H₂</u>
	1750 <u>by</u> <u>He</u>
	1350 <u>by</u> <u>Mg</u>

Mg II

Stark, E	557, 1573, 1879
Stark, T	1058, 1330, 1501,
	1558, 1699
Stark, T, E	1871
Van der Waals, T	1750 <u>by</u> <u>Ar</u>
	1750 <u>by</u> <u>H₂</u>
	1750 <u>by</u> <u>He</u>

Mn (Manganese)

Mn I

Van der Waals, E	646, 1451 <u>by</u> <u>Ar</u>
	646 <u>by</u> <u>He</u>
	531 <u>by</u> <u>N₂</u>

Mo (Molybdenum)

Mo I

Van der Waals, E	1451 <u>by</u> <u>Ar</u>
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N (Nitrogen)

N I

Resonance, E	1622
Stark, E	862, 1319, 1482,
	1485
Stark, T	1225, 1706
Van der Waals, E	834, 854, 1622
	<u>by</u> <u>Ar</u>
	834, 854, 1622,
	1667 <u>by</u> <u>He</u>
	592, 775, 834, 854,
	1667 <u>by</u> <u>N₂</u>
	834, 854, 1667
	<u>by</u> <u>Ne</u>
Van der Waals, T	1477, 1493, 1494
	<u>by</u> <u>He</u>

N II

Stark, E	116, 122, 971, 972,
	1102, 1142, 1143,
	1589, 1606, 1616
Stark, T	1069, 1150, 1160,
	1265, 1435, 1501,
	1646, 1771, 1815

Stark-Natural, T	1878
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N III

Stark, E	122, 1341
Stark, T	1771, 1815

N V

Doppler, E	975
Stark, E	1072
Stark, T	1581, 1815

*The numbers refer to paper identification numbers of Part 3.

Description

Reference No.*

Na (Sodium)

Na I

Doppler, E	546
Natural, E	100
Pressure, E	164, 546, 766
Pressure, T, E	74
Resonance, E	79, 149, 292, 427, 433, 456
Resonance, T	75, 324, 1003, 1515, 1663
Resonance, T, E	1052
Stark, E	485, 501, 507, 530, 906, 1486, 1613
Stark, T	218, 432, 767, 828, 893, 894, 980, 1706, 1734, 1760
Van der Waals, C	468 <u>by Ar</u>
Van der Waals, E	392
Van der Waals, E	84, 100, 115, 172, 180, 183, 184, 186, 202, 205, 326, 391, 410, 704, 781, 887, 888, 1002, 1451 <u>by Ar</u> 887, 888 <u>by CO₂</u> 243 <u>by Cs</u> 84, 100, 115, 149, 172, 180, 181, 202, 247, 308, 410, 791, 1002 <u>by H₂</u> 100, 115, 149, 180, 183, 184, 186, 202, 704, 887, 888, 1002, 1107, 1453, 1572 <u>by He</u>

Description

Reference No.*

Van der Waals, E
(cont.)191 by Hg115 by Hydro-
carbons704, 1002 by Kr

56, 100, 115, 172

181, 202, 247, 308

391, 410, 451, 507

531, 716, 887, 888

1002 by N₂

100, 115, 180, 183

184, 186, 202, 704

1002, 1107, 1453

by Ne704 by Xe

Van der Waals, T

563, 602, 794, 1052

1507, 1590, 1750

by Ar

1760, 1783, 1881

by H1750 by H₂

354, 602, 794,

1590, 1645, 1647,

1750 by He1297, 1872 by Kr794 by N₂

602, 1297, 1872

by Xe

Van der Waals, T, E

503 by Ar

Natural-Resonance, E

85

Resonance-Zeeman, T

1332

Stark-Doppler-Resonance-

Van der Waals, E

906 by N

Ne (Neon)

Ne I

Line, E

408

*The numbers refer to paper identification numbers of Part 3.

<u>Description</u>	<u>Reference No.*</u>
Natural, E	190, 1828
Pressure, E	428, 1284, 1789
Pressure, T	1458
Resonance, E	387, 1141, 1188, 1398, 1828
Resonance, T	1196, 1628
Resonance, T,E,C	1466
Stark, E	538, 1310, 1633, 1635, 1638
Stark, T	1706, 1775
Van der Waals, E	1106, 1141, 1300, 1335, 1398, 1478 <u>by He</u> 1481 <u>by He-Ne</u> 1224, 1465, 1631, 1787 <u>by Ne</u>
Van der Waals, T	1775 <u>by Ne</u>
Stark-Resonance, E	1787
Doppler-Van der Waals, E	1287, 1448 <u>by He</u>
	Ne II
Pressure, E	1774
Stark, E	139, 603, 784, 786
Stark, T,E	857

Ni (Nickel)

	Ni I
Resonance, E	1469
Stark, E	76
Van der Waals, E	1452, 1469, 1778 <u>by Ar</u> 1452, 1469 <u>by He</u> 531 <u>by N₂</u>

<u>Description</u>	<u>Reference No.*</u>
O (Oxygen)	
	O I
Stark, E	846, 864, 1310, 1319, 1482, 1550, 1627, 1633
Stark, T	1225, 1501, 1706
Van der Waals, E	565, 1762 <u>by Ar</u> 565 <u>by N₂</u> 1521 <u>by O₂</u>
Van der Waals, T	1320 <u>by O</u>
	O II
Stark, E	139
	O III
Stark, E	139, 1341
	O VI
Doppler, E	975
Stark, E	1154
Stark, T	1265, 1815

P (Phosphorus)

	P I
Stark, E	1310, 1633
Stark, T	1706
Van der Waals, E	782 <u>by He</u> 782 <u>by Ne</u>
	P II
Stark, E	1310

*The numbers refer to paper identification numbers of Part 3.

DescriptionReference No.***Pb (Lead)****Pb I**

Resonance, E	1178
Stark, E	1612

Rb (Rubidium)**Rb I**

Line, T,E	1307
Resonance, E	277,341,457
Resonance, T	324,1003,1515, 1663
Stark, E	1613
Van der Waals, C	939 <u>by</u> <u>Xe</u>
Van der Waals, E	235,236,248,276, 390,424,497,540, 562,616,697,704, 781,837,1066,1067, 1387,1390,1428, 1429 <u>by</u> <u>Ar</u> 1387 <u>by</u> <u>CH₄</u> 562,836,1067 <u>by</u> <u>D₂</u> 247,248,276,278, 497,562,791,836, 1067 <u>by</u> <u>H₂</u> 235,236,248,276, 390,424,497,562, 616,704,781,1387, 1390 <u>by</u> <u>He</u> 522,562,569 <u>by</u> <u>Hydrocarbons</u> 497,534,562,704, 1065,1067,1390, 1601 <u>by</u> <u>Kr</u>

DescriptionReference No.*

Van der Waals, E
(cont.)

247,248,278,390,
497,562,616,716,
1387 by N₂
235,236,248,262,
279,280,497,562,
704,1064,1067,
1387,1390 by Ne
206,277 by Rb
497,534,704,898,
1390 by Xe

Van der Waals, T

602,606,670,713,
987 by Ar
602,606,670,713
by He
606,670,713,987,
1297,1872 by Kr
606,670,713 by
N₂
606,670,713 by Ne
602,606,713,987,
1297,1872 by Xe

Van der Waals, T,E

503,1443 by Ar
1443 by D₂
1443 by H₂
* 503,1716 by He
1443 by Kr
503 by N₂
1443 by Ne

Rb II

Van der Waals, T,E

1443 by Kr

S (Sulfur)**S I**

Resonance, E

117

*The numbers refer to paper identification numbers of Part 3.

<u>Description</u>	<u>Reference No.*</u>
Stark, E	1038, 1153, 1310, 1633
Stark, T	1706
S II	
Stark, E	1153, 1310
Stark, T	1069, 1160, 1164, 1328, 1330, 1501
S III	
Stark, T	1330, 1501, 1815
S IV	
Stark, T	1815
S VI	
Stark, T	1815

Sb (Antimony)

Sb I	
Pressure, E	195
Stark, E	1613
Sb II	
Pressure, E	195
Sb III	
Pressure, E	195

Sc (Scandium)

Sc II	
Van der Waals, T	1750 <u>by</u> <u>Ar</u> 1750 <u>by</u> <u>H₂</u> 1750 <u>by</u> <u>He</u>

<u>Description</u>	<u>Reference No.*</u>
Si (Silicon)	
Si I	
Line, T	1743
Stark, E	734, 1310, 1612, 1630, 1633
Stark, T	1350, 1706, 1889
Van der Waals, E	1171, 1416, 1866 <u>by</u> <u>Ar</u> 1630 <u>by</u> <u>H</u>
Van der Waals, T	1750 <u>by</u> <u>Ar</u> 1750 <u>by</u> <u>H₂</u> 1750 <u>by</u> <u>He</u> 1350 <u>by</u> <u>Si</u>

Si II	
Stark, E	734, 1310, 1618
Stark, T	1283, 1330, 1501, 1815, 1889
Stark-Natural, T	1878
Si III	
Stark, E	734, 784, 922
Stark, T	1330, 1501, 1815, 1889
Stark, T,E	857
Stark-Natural, T	1878

Si IV	
Stark, E	734, 922
Stark, T	1815
Stark, T,E	857
Stark-Natural, T	1878

*The numbers refer to paper identification numbers of Part 3.

Description Reference No.*

Sn (Tin)

Sn I

Pressure, E 208
Stark, E 1612

Sn II

Pressure, E 208

Sn III

Pressure, E 208

Sn IV

Stark, E 784,922

Sr (Strontium)

Sr I

Resonance, E 1487
Van der Waals, E 888,1488,1746
by Ar
888 by CO₂
888,1488,1746
by He
1488 by Kr
531,716,888,1605
by N₂
1488 by Ne

Sr II

Stark, E 543,614,1805,1879
Van der Waals, T 1750 by Ar
1750 by H₂
1750 by He

Sr IV

Stark, T,E 857

Description Reference No.*

T (Tritium)

T I

Van der Waals, E 643,696,789,
1742 by Ar
643,696,789
by Ne

Te (Tellurium)

Te I

Stark, E 1613

Ti (Titanium)

Ti I

Stark, E 924
Van der Waals, E 1191,1263 by Ar
924 by H
Van der Waals, T 1750 by Ar
1750 by H₂
1750 by He

Ti II

Van der Waals, E 1191 by Ar
924 by H

Tl (Thallium)

Tl I

Doppler, E 546
Pressure, E 546
Resonance, E 136
Stark, E 1613
Van der Waals, C 1172 by Hg

*The numbers refer to paper identification numbers of Part 3.

<u>Description</u>	<u>Reference No.*</u>
Van der Waals, E	392
Van der Waals, E	237, 616, 622, 702
	by <u>Ar</u>
	622, 974 by <u>H₂</u>
	237, 702 by <u>He</u>
	21 by <u>Hg</u>
	702 by <u>Kr</u>
	531 by <u>N₂</u>
	702 by <u>Ne</u>
	136 by <u>Tl</u>
	702 by <u>Xe</u>

Xe (Xenon)

	Xe I
Resonance, E	173, 936, 982, 1568
Resonance, T	1196
Van der Waals, E	372, 410, 936, 1174,
	1399 by <u>Ar</u>
	410, 1174, 1399 by
	<u>H₂</u>
	936, 1174, 1399,
	1568 by <u>He</u>
	936, 1399 by <u>Kr</u>
	410 by <u>N₂</u>
	936, 1174, 1399,
	1568 by <u>Ne</u>
Van der Waals, T	1808 by <u>Ar</u>
	1808 by <u>Kr</u>
	1808 by <u>Ne</u>
Van der Waals, T, E	1443 by <u>Ne</u>

<u>Description</u>	<u>Reference No.*</u>
Zn (Zinc)	
	Zn I
Pressure, E	49
Resonance, E	136
Resonance, T	896
Stark, E	669, 758, 1193
Van der Waals, E	1199, 1406 by <u>Ar</u>
	1199, 1406 by <u>He</u>
	1483 by <u>Hg</u>
	1199, 1406 by <u>Kr</u>
	1199, 1406 by <u>Ne</u>
	1199, 1406 by <u>Xe</u>
	136 by <u>Zn</u>

	Zn II
Stark, E	1193

*The numbers refer to paper identification numbers of Part 3.

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1895

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Anderson, L. W.	592, 643, 696, 1002	Bacon, M. E.	1250, 1379, 1380, 1381, 1552, 1697, 1708
Anderson, P. W.	350, 402, 443, 495	Baird, J. C., Jr.	592, 643, 696
Anderson, V. E.	1101	Bali, L. M.	1698
Ando, K.	1137, 1794	Balin, G. P.	225, 226
Andreeva, T. L.	974	Ballik, E. A.	1040
Antonov, A. S.	1549	Balling, L. C.	1522, 1667, 1669
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Barnard, A. J.	1251,1383,1384, 1553,1791
Barnes, K. S.	1554,1699
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Bartels, H.	351,352,366,422, 517,759
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Bayer-Helms, F.	823,824,825,826
Bazhov, A. S.	1555
Beaty, E. C.	561,562
Beck, R. J.	1630
Becker-Ross, H.	1745
Beckner, E. H.	913
Bederson, B.	1556
Behmenburg, W.	887,888,1252
Behringer, K.	1700
Bekefi, G.	1525,1701,1702
Bekenstein, J. D.	1557
Bely, O.	1385,1558
Belyaev, M. P.	1357
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Ben-Reuven, A.	963,1041,1042, 1140,1386,1559, 1704
Ben-Yosef, N.	1705
Benattar, R.	1382
Bender, P. L.	561,562,699,889, 1387
Benedict, W. S.	760
Benett, S. M.	1706
Bengtson, R. D.	1253,1388,1560, 1561,1633
Bennett, R. B.	497,646
Bennett, W. R., Jr.	1141, 1886,1887
Berg, H. F.	761,1043,1142, 1143,1620
Bergeon, R.	404,444,468,503, 563
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Berman, P. R.	1389,1562,1707
Bernstein, M. J.	975
Berreman, D. W.	1254
Besombes, F.	1390
Beuchelt, R.	517
Bezzerides, B.	1144,1145,1391, 1392
Bhattacharyya, D.K.	315
Biberman, L. M.	367
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Billings, D. E.	891	Braun, W. G.	1393, 1708
Biondi, M. A.	969	Brechot, S.	828, 893, 894, 1149, 1150, 1151, 1169, 1255, 1330, 1501, 1502, 1573, 1627, 1815
Birkeland, J. W.	1146, 1393, 1708	Breene, R. G., Jr.	519, 701, 895, 1152, 1256, 1257, 1565, 1566, 1567, 1710
Birnbaum, G.	1044, 1147	Breit, G.	594
Blandin, J.	1157, 1255, 1261	Bretagne, J.	1382
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Bloom, A. L.	644, 1045, 1046	Brissaud, A.	1711, 1748, 1749
Bloom, S.	423, 478	Brochard, J.	1162, 1568
Bober, L.	1394, 1446	Brocklehurst, M.	1712, 1713
Böhm, K. H.	645	Brout, R.	520
Bötticher, W.	827, 1179	Brown, R. A.	1258
Bogen, P.	518, 1563, 1860	Broyles, A. A.	471, 521, 564
Boggs, J. E.	1204	Bruce, C. F.	1714
Boldt, G.	892, 964	Brueckner, K. A.	1715
Bolwijn, P. T.	1148	Buckmaster, H. A.	1396
Bonczyk, P. A.	1409	Budini, P.	260
Bondarev, A. F.	762	Bueren, H. G. van	1048
Borenstein, M.	1286, 1861	Bues, I.	1397
Born, M.	159	Bulos, B. R.	1716, 1717
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Bracewell, R. N.	470		
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Burkhardt, G.	275	Chapelle, J.	1157,1255,1261, 1573
Burnett, J. C.	1631	Chappell, W. R.	1400,1574,1723, 1729,1820,1821
Burshtein, A. I.	966,1049,1050, 1051,1155,1260, 1885	Chebotaev, V. P.	1141,1305
Butaux, J.	967,1156,1194	Chen, C. L.	1262
Byron, F. W., Jr.	896,897	Ch'en, S. Y.	235,236,247,248, 276,277,278,308, 341,353,405,424, 455,472,497,522, 523,533,646,647, 702,703,704,898, 939,1062,1158, 1173,1401,1402, 1403,1440,1450, 1451,1452,1575, 1659,1724,1725
Cabannes, F.	1157,1261	Cheng, R.	1726
Caby, M.	1636,1721	Chi, A. R.	561,562
Cairns, C. J.	1571,1719	Chiarella, C.	1053
Carazza, B.	1641	Choong, S. P.	206
Carr, J. B.	644	Choudhury, M. H.	1404
Carrington, C. G.	1398	Chow, K.-W.	1510
Carver, T. R.	556,697	Chowdhury, S. S.	1405
Casimir, H.	161	Chudzynski, S.	968
Castex, M. C.	1174,1399	Churchwell, E.	1727
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Chaika, M. P.	1273		
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Clarke, G. A.	763
Clayton, E. D.	405
Cohen, V. W.	1387
Connor, T. R.	969
Cook, D. W.	1406
Cooper, C. D.	565
Cooper, J.	929,965,1054, 1055,1159,1160, 1381,1383,1384, 1400,1407,1408, 1486,1508,1511, 1512,1513,1515, 1518,1553,1574, 1576,1584,1665, 1723,1728,1729, 1753,1758,1820, 1821,1824,1832, 1866,1884
Cooper, M.	1726
Cooper, W. S.	892,1577,1651, 1869
Cordover, R. H.	1409
Corney, A.	1398,1410
Coulaud, G.	1602,1648,1649, 1883
Cowley, C.	1411,1590,1730, 1750
Craggs, J. D.	332,383,798
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Curtis, W.	534
Curzon, F. L.	1327
Czuchaj, E.	1412,1588,1731
Dahmen, M.	1263
Dalenoort, G. J.	1056,1161,1413, 1414,1578,1579, 1732
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Das, G.	1580,1645
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Davies, J. T.	829
Davies, R. D.	1798
Davis, J.	1163,1164,1214, 1264,1265,1328, 1581,1733,1734
Davis, J. F.	1608
Davis, W. D.	1388
Davison, W. D.	1415
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Debye, P.	46	Dronov, A. P.	705
De Croutte, E.	837,838	Dubovik, V. M.	1663
deHaas, N.	1521	Dubrovskii, G. B.	496
DeSilva, A. W.	1467	Dudkin, V. A.	974
Deutsch, C.	1073,1266,1267, 1417,1418,1419, 1420,1421,1583, 1736	Duffieux, P. M.	648
DeWitt, H.	927	Dufty, J. W.	1424,1737
Di Giacomo, A.	899,973,1057	Dugan, C. H.	1762
Dicke, R. H.	425,446	Dumont, S.	1058
Dickerman, P. J.	566,764	Du Plessis, A. N.	1604
Dillon, T. A.	1584,1723,1820, 1821	Durham, J.	1105
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Dolgov-Savel'ev, G. G.	1585	Dyne, R. J.	1425
Donohue, R. J.	1306	Eberhagen, A.	975,1587
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Doyle, R. O.	1503	Ecker, G.	524,525,526, 1426,1427,1740
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Drawin, H. W.	928,1073,1091, 1165,1205,1266, 1267,1419,1420, 1421,1423,1736	Edels, H.	383
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Elyashevich, M. A.	767,980
Ensberg, E. S.	1270,1428,1429, 1742
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Ervens, W.	1142,1143
Evans, D. L.	1167
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Evdokimov, Yu. V.	1272,1273,1430
Exton, R. J.	845,1431,1744
Fabre, E.	831
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Farr, J. M.	1274,1449,1604, 1746

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Fawcett, B. C.	1154
Feautrier, N.	1150,1151,1169, 1170,1275
Feiter, L. D. de	1060
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Gallagher, C. C.	1625,1751
Gallo, C. F.	1172,1757
Galt, J. A.	527,528
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Garrett, R. O.	1062,1158,1173, 1575,1724
Garrison, R. L.	1319,1482
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Gössler, F.	162,163,185, 187,200
Gold, L.	650
Goldenbaum, G. C.	1467
Goldfarb, V. M.	905
Goldsmith, S.	1276,1670
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Granier, J.	836,837,838, 978,979,1064, 1065,1066,1067, 1174,1390
Granier, R.	710,836,837, 838,978,979, 1064,1065,1066, 1067,1174,1390, 1399,1443
Grechikhin, L. I.	766,767,839, 906,980
Gregory, C.	297

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Greig, J. R.	929,1280,1388, 1592,1593,1635, 1768
Gridneva, S. M.	1068
Griem, H. R.	448,572,596, 651,652,653, 711,761,768, 769,770,771, 772,902,907, 908,961,972, 981,1069,1070, 1175,1176,1177, 1280,1281,1282, 1283,1296,1301, 1439,1444,1445, 1467,1558,1589, 1592,1594,1595, 1596,1597,1635, 1706,1754,1755, 1756,1768
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Gubin, M. A.	1284
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Harrison, G. R.	74
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Hartmann, F.	1601
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Herman, R.	485, 507, 530, 713, 760
Hermansdorfer, H.	975
Hernandez, G.	1074
Hessberg, H.	1179
Hettner, G.	597, 598
Hey, P.	714
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Hiei, E.	617
Higgins, R. B.	1698

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Higgs, L. A.	792	Howard, R. S.	1762
Hildum, J. S.	1758	Hunag, S.	656
Hill, R. A.	912, 913, 1063, 1075, 1180, 1181, 1603, 1759	Huber, D. L.	1078
Hilliard, R. L.	1076	Hughes, D. G.	718
Hindmarsh, W. R.	567, 599, 600, 654, 715, 1182, 1274, 1441, 1449, 1479, 1604, 1746	Hughes, D. S.	228
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Hollander, Tj.	1011, 1605	Hulst, H. C. van de	335
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Holtsmark, J.	47, 48, 69, 75, 76	Hutchinson, D. A.	1623
Holweger, H.	1320, 1760, 1761	Ikenberry, D.	1763
Hooper, C. F., Jr.	1077, 1218, 1289, 1290, 1339, 1876	Illinger, K. H.	1344
Hopwood, W.	332	Ilyina, E. V.	905
Horodniczy, H.	244, 265	Imazato, A.	147
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		Iova, I.	985, 1080, 1183 1292, 1454

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Ivashevskii, S. N.	901	Jensen, V. O.	1082
Iwao, M.	1764	Johannesson, J.	190
		Johnson, M.	476
Jablonski, A.	137,230,244,246, 265,267,282,316, 343,842,986,1293, 1455	Johnson, W. B.	1514
Jackson, C. V.	216	Jones, A. F.	1185,1607
Jackson, J. L.	658	Jones, L. A.	1592,1593,1768
Jacobson, H. C.	1436,1765,1766, 1858,1870	Joos, G.	54,61,369
Jäger, H.	1456	Jürgens, G.	407
Jager, C. de	406,659,843	Jugaku, J.	499,601
Jalufka, N. W.	1081,1606	Jung, M.	846
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Jansen, B. J.	1605	Kaldor, U.	1776
Javan, A.	1108	Kalinin, Yu. G.	1836,1837
Jaya Ram, K.	1764	Kaliteyevskii, N. I.	1273
Jeannet, J. C.	1650	Kalman, G.	732
Jefferies, J. T.	660,1294	Kaplan, S. A.	1457
Jefimenko, O.	497,522,533,534, 569,844,845,914, 987,988	Kapuscinska, M. I.	674
Jenckel, L.	289	Karamcheti, K.	1299
Jenkins, J. E.	1767	Kasabov, G. A.	1068
		Kastha, G. S.	355,427
		Kastler, A.	847
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Kenty, C.	148	Kol'chenko, A. P.	1463
Kepple, P.	1295,1296,1561, 1603,1759,1769	Kolesnikov, V. N.	675
Khakhaev, A. D.	1300,1465,1775	Koloshnikov, V. G.	722
Khoshev, Yu. M.	1660	Koloshnikov, V. K.	580
Khristov, N. N.	1458	Kondrat'eva, E. V.	1612,1613
Kieffer, J.	1459	Konjevic, N.	1464,1614,1615, 1616,1617,1618, 1619,1643,1772, 1773,1802,1804, 1805,1879
Kielkopf, J. F.	1285,1297,1608, 1872	Konovalov, Yu. N.	778
Kim, D. M.	1609,1652	Koopman, D. W.	1560
Kimura, M.	63,64	Kopfermann, H.	289
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Klein, L.	602,606,1460	Kossakowski, A.	849
Kleman, B.	326,1662	Koutsoyannis, S. P.	1299
Klimontovich, Yu.L.	1696,1770	Kozhushner, M. A.	1187
Kluiver, H. De	502,539,609,610	Krey, R. U.	1318,1319
Knall, E.	451	Kreye, W. C.	1774
Knutson, J. W., Jr.	1141	Krieger, J. B.	1557
Kobzev, G. A.	1771	Kröll, W.	1427
Kogan, V. I.	570,571,661,721, 848,916,1186,1298, 1461,1462,1819		
Kohler, D. A.	424		

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Krogdahl, M. K.	309,310,317,336
Krylova, S. I.	1300,1465,1775
Kubiak, M.	909
Kubo, R.	452
Kudrin, L. P.	850,851,852, 853,917
Kuhn, H. G.	188,189,231,232, 233,918,990, 1188,1466
Kulp, M.	150,166
Kundt, H. E.	187
Kunik, D.	1776
Kunze, H. J.	1301,1445,1467
Kunze, P.	138
Kurochka, L. N.	1189,1302,1303, 1468
Kusch, H. J.	573,1171,1190, 1191,1192,1193, 1263,1288,1621, 1777,1778
Kushnikov, Yu. A.	344
Kutsyn, A. A.	1672
Kuzemsky, A. L.	1779
Kwiatkowski, S.	849,919
Labat, J.	1464,1614,1615, 1616,1617,1618, 1619,1643,1802, 1804

<u>Author</u>	<u>Ref. No.*</u>
Lagarde, D.	723,779,991, 1194
Lalos, G. T.	780,781
Lamb, W. E., Jr.	1286,1389,1562, 1609,1652,1707, 1861
Lambert, R. H.	782,789,854, 1522,1667,1669
Lambropoulos, P.	1195
Landheer, B.	1780
Lang, K.	387,408,428,536
Lapworth, K. C.	724
Larenz, R. W.	657,719,783,841, 984,1079,1291
Lau, E.	190
Laurent, J.	1469,1622
Lawetz, V.	1623
Lazarev, A. V.	1624
Leckrone, D. S.	1781
Lee, R.	1782,1873
Lee, Y. C.	1470
Leeman, S.	1712
Legowski, S.	725
Lemaire, J. L.	1809,1810
Lennuier, R.	723,967,991, 1156,1194
Lenz, W.	167,168

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Levine, M. A.	1625,1751
Lewis, E. L.	990,1188,1196 1403,1471,1472, 1783,1784
Lewis, M.	537,574,607,726
Leycuras, Y.	855,856,1083, 1084
Lichtenstein, M.	565
Lifshitz, E. V.	1304,1473
Lightman, A.	1140
Lim, C. P.	1280
Lin, D. L.	1470
Lincke, R.	761,920
Lindholm, E.	290,326,327,1662
Lisitsa, V. S.	1186,1461,1819, 1874
Lisitsyn, V. N.	1305
Lloyd, P. E.	228
Lochte-Holtgreven, W.	479,1778
London, F.	189
Lonseth, A. T.	1725
Looi, E. C.	1158,1173
Lorentz, H. A.	11
Lortet, M. C.	1474
Louboutin, R.	1476
Louër, D.	1475,1476

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Lüscher, E.	775,834
Luizova, L. A.	1300,1465,1775
Luk'yanov, S. Yu.	575
Lyle, G. C.	1378
Lyon, W. D.	1626
Lyons, J. D.	1477,1495
MacDonald, D.K.C.	718
Machekute, R.	1483
Magidson, V. V.	778
Maissel, L. I.	603
Majkowski, R. F.	1306
Makarov, A. P.	1478
Maldonado, P.	1645
Malinovsky, M.	1627
Malyshev, V. I.	974
Manakov, N. L.	1735
Manassah, J. T.	1628,1747
Mandel'shtam, S.L.	370,538,580,604, 605,608,722,784, 857
Marasanov, Yu. P.	722

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Margenau, H.	151,169,170,171, 172,174,204,217, 234,356,388,423, 478,480,481,482, 537,574,602,606, 607,662,663,713, 733
Marinkovic, M. D.	921
Marmet, P.	1807
Marshall, A.	1717
Maschke, E. K.	1085
Massmann, P.	1778
Mathur, B. S.	1307
Matskevich, V. K.	1663
Matsuo, S.	727
May, A. D.	1406
Mazing, M. A.	538,580,604,605, 608,722,785,786, 857,921,922,1086, 1136,1785
Maznichenko, M. E.	1672
McCartan, D. G.	1479
McCarthy, W. J.	1094
McCourt, F. R.	1829
McDermott, M. N.	897
McDonald, J. K.	429
McLean, E. A.	992
McLennan, J. C.	173

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McNally, J. R., Jr.	1651
McNamara, L. F.	1783
Mead, C. A.	664,1003,1308, 1626
Mechev, V. S.	1629
Meier, H.	84
Meinhold, G.	1191
Menon, T. K.	1480
Mensing, L.	77,126
Messerschmidt, D.	1197
Meunier, J.	1321
Mewe, R.	923
Meyer, J.	924,1630,1631
Meyerott, R.	481,482
Mezhericher, E. M.	392
Michels, A.	502,539,609,610
Michels, H. H.	1783
Michelson, A. A.	6
Middelkoop, D.	609
Mies, F. H.	1309
Mihalas, D.	993,1632
Mikhnenko, G. A.	1279,1442,1481, 1786
Miller, M. H.	1310,1388,1560, 1633,1787

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Minaeva, L. A.	1087,1311,1312, 1313	Mozer, B.	593,667,668,698
Minkowski, R.	56,85,115,205	Mrowka, B.	152
Minnhagen, L.	925	Müller, E. A.	1320
Misell, D. L.	1185,1607	Müller, K. G.	997
Misyunas, A.	665,728,787,994, 1198,1199,1200, 1314,1315,1316, 1483,1634	Mugglestone, D.	903,1088
Mitchell, A. C. G.	729	Muntenbruch, H.	669
Mitrovic, V.	1616	Murakawa, K.	1089,1090
Mittleman, M. H.	1201	Murari, J.	315
Mizushima, M.	926,995,1202, 1203,1584,1788	Murphy, J. S.	1204
Molchanov, M. I.	1789	Murphy, P. W.	864
Monaghan, J. J.	1790	Naberukhin, Yu.I.	966,1051,1155
Moo-Young, G. A.	1280,1635,1787	Nakamura, G.	63,64
Moore, G. E.	760	Nakayama, T.	927
Moore, L.	1317	Narumi, H.	727,1345,1661
Morgan, C. L.	1270,1742	Nayyar, V. P.	1337
Mori, K.	1794	Neidigh, R. V.	1651
Morin, S.	1581,1733,1734	Nelson, R. H.	1791
Morita, T.	666	Neufeld, C. R.	1251
Morozov, V. A.	996	Neumann, E. A.	125
Morris, J. C.	1318,1319,1482	Neven, L.	406,843
Moser, H.	483,611	Nguyen-Hoe	928,1073,1091, 1165,1205,1266, 1267,1423,1636, 1721

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Nicolet, W. E.	1225
Niemax, K.	1875
Nieuwenhuijzen, H.	1048
Norkunas, V.	1199,1483
Norris, J.	1637,1792
Noskov, M. M.	543
Novick, R.	775,897
Nowotny, H.	1793
Nubbemeyer, H.	1484,1485,1638
Ny, T. Z.	206,235,236,247, 248
Obserschelp, E.	1192,1193
O'Brien, J. T.	1876
Obukhov-Denisov, V. V.	776
Oda, T.	1592,1768
Odintsov, V. I.	989
Oertel, G.	770,1081,1160, 1206,1408,1576, 1728
Oettinger, P. E.	1486,1639
Ofelt, G. S.	1081
Ohno, A.	730
Okamoto, K.	1794
Okazaki, K.	1794
Oksengorn, B.	1505,1506,1507

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O'Mara, B. J.	1088,1795
Omont, A.	1092,1321,1422, 1865
Orthmann, W.	78,98,99
Oss, J. P.	1393
Oxenius, J.	998
Pagel, B. E. J.	1796
Palmer, U.	1576
Palumbo, G.	1280
Pancharatnam, S.	1093
Pannekoek, A.	249
Pao, C. S.	278
Paquet, C.	1807
Paquette, D. R.	799,865
Pargamanik, L. E.	788,858
Park, D.	1797
Parker, W. J.	472
Parsons, M. L.	1094
Paterson, M. S.	371
Pavlichenko, O. S.	1672
Pavlov, M.	1322
Peach, G.	1554,1877
Peacock, N. J.	929,1154,1720

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Pedlar, A.	1798	Popenoe, C. H.	1000, 1336
Penkin, N. P.	1207, 1487, 1488	Popov, A. I.	1284
Penner, S. S.	430	Popov, A. K.	1640
Pestov, E. G.	1489	Popova, T. Ya.	1640
Peterson, D. M.	1340	Powell, W. R.	1491
Petford, A. D.	1182	Power, E. A.	612
Petropoulos, B.	1073	Powles, J. G.	1641
Peytremann, E.	1878	Praderie, F.	1170, 1208
Pfennig, H.	999, 1095, 1096, 1097, 1098, 1099, 1799, 1800	Prasad, A. N.	1322
Phelps, A. V.	1262	Preobrazhenskii, N.G.	613, 614, 835, 859, 1001, 1209, 1323
Pipkin, F. M.	592, 643, 696, 782, 789, 854, 1258	Presnyakov, L. P.	1642
Pittack, U.	930	Preston, W. M.	237
Plaat, J. J.	1605	Pretty, W. E.	116, 139
Plakhov, A. G.	1835	Prevot, J. Y.	1194
Plass, G. N.	409	Prilezhaeva, N.A.	941, 1227, 1357, 1838
Platisa, M.	1617, 1772, 1773, 1801, 1802, 1804, 1805	Pringsheim, P.	98, 99
Platz, P.	1490	Pritschow, H. P.	1621
Podgoretskii, M. I.	731	Prochorow, J.	909
Pokrovskii, A. G.	1803	Prodan, M.	985
Politzer, P. A.	1701	Protsenko, E. D.	1279, 1284, 1442, 1481, 1786
Pontecorvo, B.	191	Pruski, S.	849

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Puric, J.	1464, 1615, 1618, 1643, 1773, 1801, 1802, 1804, 1805, 1879	Reck, G. P.	1003, 1497, 1880
Putlitz, G. Zu	1428, 1429	Reesinck, J. J. M.	335
Pyatigorskii, G. M.	858	Regemorter, H. Van	577, 615, 828, 860, 893, 894, 931, 932, 1004, 1151, 1169, 1170, 1498, 1499, 1812
Queffelec, J. L.	1644, 1806	Reichel, A.	933, 1053
Quemener, J. J.	1807	Reimers, H. J.	201
Radivojevic, D.	1619	Reinheimer, J.	934
Ramberg, E.	192	Reinsberg, C.	207, 238, 250
Ramsden, S. A.	992	Richter, J.	1397
Ramsey, A. T.	1002	Richtmyer, F. K.	192
Rand, S.	1492	Ritchie, R. H.	1101
Rao, B. K.	1493	Ritter, M.	49
Rapoport, L. P.	1735	Robert, D.	995
Rautian, S. G.	576, 790, 1100, 1210, 1211, 1463, 1489, 1640	Roberts, D. E.	1102, 1164, 1212, 1213, 1214, 1264, 1265, 1324, 1325, 1326, 1327, 1328, 1646
Ravodina, O. V.	1001	Roberts, J. R.	1215
Ray, S.	1477, 1494, 1495, 1580, 1645	Robin, J.	389, 390, 391, 453, 503, 504, 540, 616, 622, 791
Rayleigh, Lord	1, 41	Robin, Si.	505, 541, 542, 578
Read, F. H.	1864	Robin, St.	372, 389, 390, 391, 404, 410, 505, 541, 542, 578, 936
Rebane, V. N.	1496		
Rebbeck, M. M.	1471, 1784		

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Robin-Kandare, S.	791
Robinson, L. B.	670
Roder, O.	827,935
Rodin, G. M.	392
Rogaczewski, J.	674
Roig, R. A.	1787
Rollett, J. S.	792
Romand, J.	372,1174,1399
Rompe, R.	251,291
Ron, A.	732
Roncin, J.-Y.	1808
Roos, O. von	793
Ross, D. W.	1103
Rossi, R.	26
Rossignol-Guzzi, D.	1438
Rostas, F.	1809,1810
Roszman, L. J.	1811
Roueff, E.	1474,1499,1647, 1812,1881
Royer, A.	1500,1813,1814
Rozinskii, M. Ya.	1803
Rubin, A. G.	1705
Rühmkorf, H. A.	252
Ruland, W.	1005,1329

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Rupin, J. M.	936
Rusanov, V. D.	1549
Sadjian, H.	733
Sahal, S. (also Sahal-Brechot, S.)	828,893,894, 1149,1150,1151, 1169,1255,1330, 1501,1502,1573, 1627,1815
Saloman, E. B.	1178
Sando, K.	1503
Sarma, M. B. K.	734
Sassi, M.	1648,1649,1650, 1882,1883
Saur, A.	369
Sayer, B.	1650
Schiller, H.	1745
Schlüter, H.	700,833,1104, 1105,1166,1331, 1504
Scholz, M.	1197,1600
Schütz, W.	100
Schütz-Mensing, L.	77,126
Schuller, F.	671,672,710,794, 1505,1506,1507, 1816
Schulz, G.	1216,1332
Schulz, H.	611

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Schulz, P.	186,202,251,253, 254,255,291,302, 1333
Schwarz, S. E.	1335
Scott, F. R.	1651
Scully, M. O.	1609,1652
Seaton, M. J.	1653,1713
Sedoi, E. A.	1786
Segre, E.	180,181,1815
Seguier, J.	831
Sekerin, V. I.	1585
Selidovkin, A. D.	1186,1334,1462
Semel, M.	1817
Serapinas, P. D.	1136,1785
Seymour, E. F. W.	649
Shabanova, L. N.	1207,1487,1488
Shain, A. L.	1527
Shamey, L. J.	1383,1384
Shank, C. V.	1335
Shapkin, V. V.	1835,1836,1837
Shen, C. S.	772
Shen, K. Y.	596,653,711,771, 1381,1508
Shepherd, G. G.	1076
Sherstkov, Yu. A.	543

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Shipman, H. L.	1654
Sholin, G. V.	851,852,853, 1509,1528,1671, 1741,1818,1819, 1834,1835,1836, 1837,1874
Shorygin, P. P.	996
Shreider, E. Ya.	1655
Shumaker, J. B., Jr.	795,1000,1336
Silverman, S.	760
Simpson, R. W.	1795
Singh, K.	1337
Sinitsyn, V. I.	575
Skalinski, T.	673,674
Skidan, V. V.	1655
Skoryupin, V. A.	1836,1837
Slater, J. C.	74
Smith, A.	647
Smith, A. L.	1510
Smith, D. W.	834
Smith, E. W.	1217,1218,1338, 1339,1400,1511, 1512,1513,1518, 1574,1584,1665, 1723,1729,1753, 1820,1821,1832, 1884
Smith, G.	1182,1219,1349

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Smith, P. W.	1106	Stampa, A.	862,935
Smolkin, G. E.	1528,1671,1834	Stansfield, B.	1631
Snijders, M. A. J.	1822	Stenholm, S.	1656
Snopko, V. N.	937	Stepanov, A. V.	731
Sobel'man, I. I.	431,432,454,506, 544,545,579,580, 620,790,857,861, 1006,1039,1087, 1100,1136,1211, 1312,1313,1548, 1693	Stokes, A. R.	345
Sobolev, N. N.	370,392,501,546, 675,705,720,776, 777	Stone, P. M.	796
Sokolovskii, R. I.	1463	Stopp, W.	1216,1332
Solarski, J. E.	799,865	Strekalov, M. L.	1885
Solyanikova, V. A.	1465,1775	Striganova, E. A.	1671,1834
Sorgen, A.	1703,1823	Strom, S. E.	1340,1654
Sorochenko, R. L.	1313	Strumia, F.	1107,1453
Sorokin, M. P.	1786	Struve, O.	656
Sorokin, V. N.	974	Stuck, D.	1638
Soru-Escaut, I.	1817	Stul'pinene, N. A.	1634
Sosnowski, T. P.	1514	Subrahmaniam, P.	1341
Spalding, I. J.	1467	Suemoto, Z.	617
Spiller, E.	1007	Sultan, G.	1382
Spitzer, L., Jr.	268,269,283	Summers, C.	821,1038
Stacey, D. N.	938,1403,1472, 1515,1824	Suprunenko, V. A.	1672
		Surtees, W. J.	1008
		Sushchinskii, M.M.	373
		Sviridov, A. G.	705
		Sy, A.	1157,1255,1261

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Sze, R. C.	1886,1887	Tietz, T.	863
Szöke, A.	1108	Timsit, R. S.	1406
Szudy, J.	1109,1110,1220, 1342,1516,1517, 1657,1825,1826	Tip, A.	1829
		Titov, A. N.	1828
		Titov, A. V.	1549
Takamine, T.	86	Tittel, H.	1419
Takebe, H.	1003	Tittel, K.	1009
Takeo, M.	455,523,647,939, 1450,1451,1452, 1658	Tomiser, J.	433,456,457,458
		Toschek, P.	1287,1448,1598
Tako, T.	735	Traving, G.	676,1010,1197, 1343
Talman, J. D.	495	Trefftz, E.	999,1097,1098, 1099
Tan, D. K. L.	1402,1659,1827	Trekhov, E. S.	1660
Tanaka, M.	1526	Trigt, C. van	1011
Tang, H.	1307	Trindle, C. O.	1344
Tankin, R. S.	1167,1394,1446	Troinikov, A. I.	1442,1480
Tannich, J. D.	1561	Trumpy, B.	76,79,87,101
Tarasov, Yu. A.	917	Tsao, C. J.	797
Tatarenkov, V. M.	1828	Tsuji, A.	1345,1661
Teller, E.	266	Tsytovich, V. N.	1457
Ten Seldam, C. A.	610	Turnbull, R.	173
Terpugova, N. S.	1001	Tvorogov, S. D.	1830
Theimer, O.	532,568,618	Tyunina, E. S.	906
Thomas, K. A.	600,715		
Thomas, P. M.	1285		

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Ultee, C. J.	1831
Underhill, A. B.	619, 1346, 1347, 1822
Unsöld, A.	218, 303, 484
Urabe, Y.	1345
Uvarov, F. A.	1012
Vainshtein, L. A.	432, 580, 620, 857, 1136
Valuzhis, A. D.	994, 1198, 1200, 1314, 1315, 1316, 1634
Van Kranendonk, J.	765
Van Vleck, J. H.	318, 356, 1078
Vanyek, U. M.	758
Vaughan, J. M.	829, 918, 938, 990, 1111, 1112, 1348, 1349, 1471, 1784
Vdovin, Yu. A.	1221, 1663, 1664
Vetter, R.	1568
Vidal, C. R.	940, 1013, 1099, 1511, 1512, 1513, 1518, 1665, 1753, 1832, 1884
Vinogradov, A. V.	1548, 1693
Vlasov, A. A.	193, 213, 219, 264, 270
Vodar, B.	391, 404, 468, 503, 504, 671, 672, 710, 1067

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Voigt, W.	31
Vojta, G.	774
Voslamber, D.	1085, 1222, 1519, 1520, 1666
Vries, R. F. de	923, 1113
Vrublevskaya, N.A.	786, 921, 922, 1086
Vujnovic, V.	798, 1014
Waddell, J. H.	619
Wagner, H.	597, 598
Wahl, A. C.	1645
Waibel, F.	117
Walasek, K.	1779
Walsh, P. J.	621
Warner, B.	1350
Warner, D.	409
Warnock, T. H.	702
Watanabe, K.	292
Watson, W. W.	172, 174, 217, 220, 234
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Weise, K.	1015
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Weisskopf, V.	127, 128, 153, 154, 175, 318

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Weitkamp, C.	622
Weizel, W.	140
Wells, D. C., III	1166
Welsh, H. L.	527,528
Wende, B.	1223,1333,1484, 1485,1638
Weniger, C.	411
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<u>Author</u>	<u>Ref. No.*</u>	<u>Author</u>	<u>Ref. No.*</u>
Zav'ya lov, G. I.	941,1227,1357, 1838	Zherebenko, A. V.	1555
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New Authors Added After January, 1972

<u>Author</u>	<u>Ref. No.*</u>	<u>Author</u>	<u>Ref. No.*</u>
Antropov, E. T.	1886	Evans, J. M.	1866
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